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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,856	01/12/2004	Maurice Gell	UCT-0040	8424
23413	7590	05/30/2006	EXAMINER	
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			XU, LING X	
			ART UNIT	PAPER NUMBER
			1775	

DATE MAILED: 05/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/755,856

Applicant(s)

GELL ET AL.

Examiner

Ling X. Xu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) 1-15, 32, 53-58, 61 and 62 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-23, 26-27, 29-31, 33-40, 43-46, 49-52, 59, 60 is/are rejected.
- 7) ☒ Claim(s) 24-25, 28, 41-42, 47-48 and 63 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 16-23, 26, 29-31, 33-36 and 59-60 are rejected under 35 U.S.C. 103(a) as obvious over Gell et al. (US 2003/0108680).

With respect to claims 16-18 and 22-23, Gell discloses a duplex microstructure comprising a fully melted region (splats) with smaller sized structure and a partially melted region (inter pass boundary) comprising larger micrometer sized structure (page 4, [0053]). The splat contains nano and submicro-sized columnar grains and the size of the incomplete melting region ranges from 100 nm to 2000 nm (page 10, [0110]).

With respect to claims 19-21, 29 and 59, Gell discloses the porosity of the microstructure material is about 6-10% (Fig. 17). Since the structure is a microstructure, the pores are considered to be less than micrometer sized. The structure is a three-dimensional structure, accordingly, the pores would also be a three-dimensional.

With respect to claim 26, Gell discloses the material comprising one or more vertical cracks, see Fig. 19-20.

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With respect to claims 30-31, 33-36 and 60, Gell discloses that microstructure material having a thickness of 200-800 micrometers and can be in the form of coatings (page 5, [0058]). The material is made of zirconium oxide stabilized with yttrium oxide (page 2, [0039]).

As stated above, Gell discloses that the splat contains nano and submicro-sized columnar grains and the size of the incomplete melting region ranges from 100 nm to 2000 nm (page 10, [0110]), which indicates that the diameter of the splat is the size of the incomplete melting region of 100nm to 2000nm plus the size of the nano sized columnar grains. Accordingly, the diameter of splat is considered overlapping or very close to the claimed range of less than 2 microns (less than 2000nm).

It would have been obvious to one of ordinary skill in the art to make splat with diameter as claimed. It has been well settled that overlapping ranges have been found to be obvious variants without the support of unexpected results. *In re Malagari* 182 USPQ 549. A prima facie case of obviousness also exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *See in re Peterson*, 65 USPQ2d 1379, 1382, citing *titanium Metals Corp. V. Banner*, 227 USPQ 773, 779.

2. Claims 16, 19-20, 26-27, 29-31 and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (Journal of Thermal Spray Technology, vol. 3(1), March, 1994 p75-104).

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With respect to claims 16 and 30-31, Lin discloses a thermal sprayed coating having thickness of greater than 25 um (abstract) to about 25 mm (page 75). The coating comprises splat of up to 80um in diameter (abstract), which includes the range as recited in claim 16.

With respect to claims 19-20 and 29, Lin discloses that the coating porosity may be less than 5% (page 5%) and since the structure is a microstructure, the pores are considered less than micrometer sized.

With respect to claims 26-27, Lin discloses that the coating comprising vertical crack in the range of 10-100 um, which can be 0.5-1.0 times of the thickness of the material when the coating thickness is greater than 25 um (page 87).

With respect to claims 33-36, Lin discloses that the material may be aluminum oxide or zirconia stabilized with yttria (page 86, table 4).

As stated above, Lin discloses the coating comprises splat of up to 80um in diameter (abstract), which overlaps the range as recited in claim 16.

It would have been obvious to one of ordinary skill in the art to make splat with diameter as claimed. It has been well settled that overlapping ranges have been found to be obvious variants without the support of unexpected results. *In re Malagari* 182 USPQ 549. A prima facie case of obviousness also exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *See in re Peterson*, 65 USPQ2d 1379, 1382, citing *titanium Metals Corp. V. Banner*, 227 USPQ 773, 779.

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3. Claims 37-38, 45-46 and 49-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al., as applied to claims 16, 19-20, 26-27, 29, 30-31 and 33-36 above, and further in view of Schlichting (a Dissertation submitted in partial Fulfillment of the Requirements of the Degree of Doctor of Philosophy at the University of Connecticut, 2000).

As stated above, Lin discloses the same coating material as recited in claims 16, 19-20, 26-27, 29, 30-31 and 33-36.

Lin does not disclose that the porosity of the material is about 15% to about 40% as recited in claim 37.

Schlichting teaches that the typical thermal barrier coating has between 10% and 20% porosity in order to exhibit better insulation and spalling resistance or better erosion resistance (page 14).

Therefore, it would have been obvious to one of ordinary skill in the art to use thermal barrier coating with porosity in the range of 10% to 20% in order to obtain the coating with better insulation and spalling resistance or better erosion resistance, as taught by Schlichting.

4. Claims 37-40, 43-46 and 49-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gell et al., as applied to claims 16-23, 26, 29-31, 33-36 and 59 above, and further in view of Schlichting (a Dissertation submitted in partial Fulfillment of the Requirements of the Degree of Doctor of Philosophy at the University of Connecticut, 2000).

As stated above, Gell discloses the same material as recited in claims 16-23, 26, 29-31, 33-36 and 59.

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Gell does not disclose that the porosity of the material is about 15% to about 40% as recited in claim 37.

Schlichting teaches that the typical thermal barrier coating has between 10% and 20% porosity in order to exhibit better insulation and spalling resistance or better erosion resistance (page 14).

Therefore, it would have been obvious to one of ordinary skill in the art to use thermal barrier coating with porosity in the range of 10% to 20% in order to obtain coatings with better insulation and spalling resistance or better erosion resistance, as taught by Schlichting.

It is noted that Gell and the present application appear to have the same assignee. Gell may be disqualified as prior art for a rejection under 35 USC 103(a). However, the burden of establishing the subject matter cited in Gell is disqualified as prior art is placed on applicants. The fact that Gell and the present application have the same assignee is not sufficient evidence to disqualify Gell as prior art. There must be a statement submitted by the applicant that the subject matter in Gell and the claimed invention were "at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

#### ***Allowable Subject Matter***

5. Claims 24-25, 28, 41-42, 47-48 and 63 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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***Response to Arguments***

6. Applicant's arguments filed 4/27/2006 have been considered but are moot in view of the new ground(s) of rejection.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling X. Xu whose telephone number is 571-272-1546. The examiner can normally be reached on 8:00 - 4:30 Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer C. McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Ling X. Xu  
Primary Examiner  
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